

Claims

1. A dual cartridge microphone comprising:
  - (a) a printed circuit board;
  - (b) a directional microphone cartridge contained on the printed circuit board;
  - (c) an omni-directional microphone cartridge contained on the printed circuit board; and
  - (d) a housing for enclosing the printed circuit board containing the directional microphone cartridge and the omni-directional microphone cartridge.
2. The dual cartridge microphone of claim 1, wherein the printed circuit board comprises a first preamplifier and a band pass filter.
3. The dual cartridge microphone of claim 2, wherein the printed circuit board further comprises a second preamplifier.
4. The dual cartridge microphone of claim 1, wherein the directional microphone cartridge generates a first electrical signal.
5. The dual cartridge microphone of claim 1, wherein the omni-directional microphone cartridge generates a second electrical signal.
6. The dual cartridge microphone of claim 4, wherein the first electrical signal is passed through the first preamplifier and the band pass filter to generate a speech signal.
7. The dual cartridge microphone of claim 5, wherein the second electrical signal is passed through the second preamplifier to generate a noise signal.
8. The dual cartridge microphone of claim 1, wherein the housing comprises a grille portion and a base portion.

9. The dual cartridge microphone of claim 8, wherein the base portion includes a socket for the connection of a microphone/communication cable.
10. The dual cartridge microphone of claim 1, wherein the directional microphone cartridge includes a cardioid polar pattern for speech pickup.
11. The dual cartridge microphone of claim 1, wherein the omni-directional microphone cartridge includes an omni-directional polar pattern for ambient noise sensing.
12. A dual cartridge microphone for detecting speech and ambient noise, the dual cartridge microphone comprising:
  - (a) a housing having a base portion and a grille portion, the grille portion allowing open air flow into the housing;
  - (b) a directional microphone cartridge contained within the housing, the directional microphone cartridge generating a first electrical signal responsive to detected speech;
  - (c) an omni-directional microphone cartridge contained within the housing, the omni-directional microphone cartridge generating a second electrical signal responsive to detected ambient noise; and
  - (d) a printed circuit board contained within the housing, the printed circuit board including filtering and protection circuits, the filtering and protection circuits coupled to the first electrical signal to generate a speech signal, and the filtering and protection circuits coupled to the second electrical signal to generate a noise signal.
13. The dual cartridge microphone of claim 12, wherein the base portion includes a socket for the connection of a microphone/communication cable.

14. The dual cartridge microphone of claim 12, wherein the directional microphone cartridge includes a cardioid polar pattern for speech pickup.
15. The dual cartridge microphone of claim 12, wherein the omni-directional microphone cartridge includes an omni-directional polar pattern for ambient noise sensing.
16. The dual cartridge microphone of claim 12, wherein the filtering and protection circuits coupled to the first electrical signal are selected from the group consisting of a RF and over-voltage circuit, a microphone bias and filter circuit, an amplifier stage circuit, a band attenuation and amplifier circuit, a RF bypass circuit, and a RF bypass and over-voltage circuit.
17. The dual cartridge microphone of claim 12, wherein the filtering and protection circuits coupled to the second electrical signal are selected from the group consisting of a microphone bias and filter circuit, an amplifier and filter circuit, and a RF bypass and over-voltage circuit.
18. The dual cartridge microphone of claim 12, wherein the housing further comprises a windscreen.
19. A dual cartridge microphone for detecting speech and ambient noise in a vehicle, the dual cartridge microphone comprising:
  - (a) a housing having a base portion and a grille portion, the grille portion allowing open air flow into the housing, the housing mounted in the vehicle;
  - (b) a directional microphone cartridge contained within the housing, the directional microphone cartridge generating a first electrical signal responsive to detected speech;

- (c) an omni-directional microphone cartridge contained within the housing, the omni-directional microphone cartridge generating a second electrical signal responsive to detected ambient noise; and
  - (d) a printed circuit board contained within the housing, the printed circuit board including filtering and protection circuits, the filtering and protection circuits coupled to the first electrical signal to generate a speech signal, and the filtering and protection circuits coupled to the second electrical signal to generate a noise signal.
- 20. The dual cartridge microphone of claim 19, wherein the vehicle is an automobile.
- 21. The dual cartridge microphone of claim 20, wherein the housing is mounted to a steering wheel in the automobile.
- 22. The dual cartridge microphone of claim 20, wherein the housing is mounted to a rear view mirror in the automobile.
- 23. The dual cartridge microphone of claim 20, wherein the housing is flush mounted in the automobile.
- 24. The dual cartridge microphone of claim 20, wherein the housing is mounted to an instrument panel in the automobile.
- 25. The dual cartridge microphone of claim 20, wherein the housing is mounted to an overhead counsel in the automobile.
- 26. A dual cartridge microphone comprising:
  - (a) a printed circuit board;
  - (b) a first directional microphone cartridge contained on the printed circuit board, the first directional microphone cartridge generating a first signal;

- (c) a second directional microphone cartridge contained on the printed circuit board; the second directional microphone cartridge generating a second signal, the first and second directional microphone cartridges placed back-to-back on the printed circuit board; and
  - (d) a housing for enclosing the printed circuit board containing the first and second directional microphone cartridges.
- 27. The dual cartridge microphone of claim 26, wherein the first directional signal and second directional signal are summed to generate an omni-directional signal.
- 28. A dual cartridge microphone comprising:
  - (a) a printed circuit board;
  - (b) a bi-directional microphone cartridge contained on the printed circuit board, the bi-directional microphone cartridge generating a first signal;
  - (c) a omni-directional microphone cartridge contained on the printed circuit board, the omni-directional microphone cartridge generating a second signal; and
  - (d) a housing for enclosing the printed circuit board containing the bi-directional microphone cartridge and the omni-directional microphone cartridge.
- 29. The dual cartridge microphone of claim 28, wherein the first signal and second signal are summed to generate a cardioid pickup pattern.
- 30. The dual cartridge microphone of claim 8, wherein the base portion includes a wire harness.
- 31. The dual cartridge microphone of claim 12, wherein the base portion includes a wire harness.